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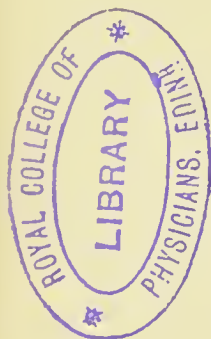
NOTES ON RHEUMATISM

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ON
RHEUMATISM

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SECOND EDITION



LONDON
J. & A. CHURCHILL, NEW BURLINGTON STREET

—
1879

PREFACE TO THE SECOND EDITION.

THE rapid exhaustion of the First Edition of this little work leads me to hope that it has not been unappreciated.

In bringing out a Second Edition, I have preferred to keep to the original brief form, but have made several additions, including a new chapter on the chemistry and mode of action of salicin, salicylic acid, and salicylate of soda, and an appendix of illustrative cases.

I may add that time has only served to strengthen and verify the views that were expressed in the First Edition.

J. P.

85, HARLEY STREET, W.

February, 1879.

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NOTES ON RHEUMATISM.

CHAPTER I.

INTRODUCTION.

RHEUMATISM—TWO ACKNOWLEDGED FORMS, THE ARTICULAR AND MUSCULAR—PROBABLY THEY ARE DIFFERENT DISEASES—THEIR CAUSES, SYMPTOMS, ETC., CONTRASTED.

THERE can be little doubt that under the general term "Rheumatism" several distinct and different diseases have been grouped together, and in many instances described and treated of as if they were only varied manifestations of the same morbid conditions.

It cannot be denied that there is a considerable resemblance—a strong family likeness—between the several forms of what

we call rheumatism, but when carefully examined many differences will be found. Leaving out of the question rheumatoid arthritis and other diseases of doubtful rheumatic origin, let us contrast the two acknowledged forms of the disease, the articular and the muscular.

Articular rheumatism is, for the most part, a disease of early adult life, commonly acute or sub-acute in character, affecting the synovial membranes and the somewhat similar serous membranes, especially those of the heart, and having a strong tendency to get well in a certain time. It is not preceded nor followed by muscular rheumatism; the two disorders in no way run into one another; on the contrary they occur quite independently, and a predisposition to the one is rarely accompanied by a predisposition to the other.

Muscular rheumatism is most common in middle or advanced life; it is usually chronic in form, and if left to itself may continue for an almost indefinite period. The parts attacked are not really the muscles, but the

white fibrous tissue that forms their aponeuroses and tendons, the different fasciæ and ligaments. There is no tendency whatever to heart mischief, and life is not threatened, though it may be embittered, by the disease.

Certain occupations, errors in diet and mode of living, which are such powerful predisposing causes in muscular rheumatism, scarcely seem to affect the liability to the articular form. Thus, although to save the very objectionable plan of giving new names to familiar disorders,* we still apply the term rheumatism to both diseases, it is obvious that they are essentially distinct and separate, and should be treated as two different complaints. It is thus that I propose to deal with them, and I shall speak of articular rheumatism first.

* In the translation of Ziemssen's new work, articular rheumatism is spoken of as "Polyarthritis Rheumatica."

CHAPTER II.

ARTICULAR RHEUMATISM—ITS FORMS—COURSE—CAUSES, PREDISPOSING AND EXCITING.

ARTICULAR rheumatism occurs in three distinct forms—the acute, the sub-acute, and the chronic; of which the two first appear to be the most common. The acute and (when at all severe) sub-acute forms are often called rheumatic fever.* The disease, when left to itself, or when uninfluenced by remedies, has an average duration of about six weeks; though mild cases may be over in a fortnight, and severe ones linger on for eight or ten weeks. As far as the mere affection of the joints is concerned, articular rheumatism tends to complete recovery, but life may be

* To save tiresome and tedious repetition of the same terms I shall use the name rheumatic fever indifferently with acute and sub-acute rheumatism.

threatened by the immediate or remote effects of heart disease, when that organ is implicated, or by meningitis, or by the supervention of hyperpyrexia. The causes of articular rheumatism may be divided into predisposing and exciting. The most important predisposing cause appears to be the presence in the blood of a morbid material, the result of some peculiarity in the patient, which is often inherited. In some persons there is such a strong tendency to the disorder, that the slightest exposure to wet and cold, or to cold only, will bring on an attack, and occasionally no exposure at all can be traced. Such individuals get an attack of rheumatic fever early in life, and suffer from the acute or sub-acute form at various intervals, until, if they live long enough, age rids them of the predisposing cause. Other persons are much less liable to articular rheumatism, and only the most disastrous circumstances — the strongest application of the exciting cause — will produce the disorder; whilst a large number of the community escape the disease

altogether, no matter to what amount of wet and cold they may be exposed.

Youth is reckoned among the predisposing causes of articular rheumatism, and probably with reason, for the *materies morbi*, the existence of which in the blood is necessary to the production of the disease, appears to be present in most cases only during that time of life which is included between the period of puberty and middle age. No doubt acute rheumatism sometimes occurs in very young children and sometimes in old persons, but I speak of the rule.

In some diseases, measles for example, youth *appears* to be a powerful predisposing cause; but, in reality, why measles almost always occurs in childhood is on account of the universal liability to the disease, and the widespread sources of infection. Older persons do not get the measles, simply because they have had the disease early in life, or, more rarely, because they are proof against it. *Mere* age is no protection. But it appears to be otherwise in articular rheumatism, for

persons may and do outlive the tendency to the disease.

Some authorities place a previous attack amongst the predisposing causes, but, I venture to think, without sufficient reason. To my mind the previous attack simply shows the liability to rheumatism—indicates the diathesis of the individual; and that it should be followed by other attacks illustrates the “*post*” rather than the “*propter*” *hoc*. A tendency to articular rheumatism exists in certain persons, just as there is a tendency to snow-storms in the winter, or gales of wind at the equinoxes; but we do not think of one snow-storm or one gale of wind that it predisposes to others, but merely that it indicates the presence of certain proclivities in the weather: and so with one attack of rheumatism. Sex, occupation, errors in diet, do not seem to exercise much influence on the production of articular rheumatism; but loss of health or debility in any form certainly increases the liability to the disease, probably by bringing any latent predisposition that may exist into activity.

The most important *exciting* cause, perhaps the only one worth considering, is exposure to cold, and especially to cold and wet. Sleeping in a damp bed with insufficient clothing,* remaining in wet clothes, sitting in a draught of cold air when heated, in fact getting a "chill" in any way, will often induce acute rheumatism in those who are predisposed to it. Possibly it is the check thus given to the eliminating functions of the skin that determines an attack of the disease.

The climate of the temperate zones is more productive of rheumatism than the colder or hotter regions of the world; for it is in the temperate zones that we get the combination of wet and cold that is so fruitful of the disorder.

* It may be well to mention here that it is wet *and* cold that are so injurious, and if any one find himself in a damp bed he may minimise the mischief, perhaps save himself from any harm, by heaping on plenty of clothes, or by getting rid of the sheets, and sleeping between the blankets only.

CHAPTER III.

RHEUMATIC FEVER—ITS SYMPTOMS—THE TENDENCY TO
INFLAMMATION OF THE SEROUS MEMBRANES—HYPER-
PYREXIA—CHRONIC ARTICULAR RHEUMATISM.

RHEUMATIC fever generally begins with symptoms of having taken cold and with fever, which are quickly followed by the appearance of inflammation in one or more of the joints. In some cases, however, the joint affection occurs simultaneously with the constitutional symptoms. The inflamed joint is red, swollen, painful, and very tender, so that the least pressure gives great pain. As a rule, the larger joints are more commonly affected—the knee, ankle, elbow, and wrist; less frequently the shoulder and hip; but in many cases the smaller joints, those of the hand and fingers, participate in the disease. Sometimes one or two joints only are

attacked, sometimes a large number; and it is a remarkable feature of the disease, clearly indicating its constitutional character, that the inflammation occasionally rapidly disappears in one joint and as rapidly appears in another. This is spoken of as metastasis.

Along with the joint mischief there is, in severe cases, considerable constitutional disturbance, indicated by an increased temperature, a full rapid pulse, a hot skin, a thickly coated tongue, constipated bowels, and scanty, high-coloured urine, often very acid, which deposits on cooling a copious cloud of red lithates. In the acute and sub-acute cases the temperature will range from 100° to 105° Fahr.; and when hyperpyrexia supervenes the thermometer will indicate a temperature still higher, varying from 106° to 110° , or even more.

The tongue is thickly coated, but not red nor feverish looking at the tip and edges. It differs in this from the tongue of early continued fever, and is pale and rather swollen, like the tongue of quinsy or an

acute stomach attack. There is generally complete loss of appetite. Another symptom, one that is rarely absent, is a constant drenching sweat, bathing the patient from head to foot, and having a peculiar acrid odour, which is very characteristic of the disease. In most cases this sweat is intensely acid, turning blue litmus paper to a bright scarlet, but when it is very profuse the great acidity is less marked.

With few exceptions, the mind is entirely unaffected, and delirium is rare, but the pain of the inflamed joints sometimes deprives the patient of sleep. The slightest movement, when the articulations are severely affected, is productive of great agony, and the sufferer lies helpless and motionless, paralysed by pain.

It would be well if the description of acute rheumatism could end here, but, unfortunately, the disease often involves other and important structures. Serous membranes are closely allied to synovial in their formation and functions, and share with

them the liability to be attacked by rheumatic inflammation. The pericardium, the endocardium, the pleuræ, the peritoneum, the meninges of the brain, may, one or more of them, be involved in the disorder; but the first two far more often than any of the others, so much so that some German authorities look upon cardiac mischief as the very essence of acute rheumatism. Be this as it may, there is no doubt that peri- or endo-carditis, or both, are very frequently associated with rheumatic fever, and more especially when it occurs in young persons. The earlier the age at which the disease makes its appearance, the more likely is it to be accompanied by cardiac mischief; which would seem to show that the implication of the heart is due, at any rate in most cases, to a strong rheumatic tendency. When the heart is involved the constitutional disturbance is generally much aggravated, and accompanied by the special symptoms of cardiac inflammation, into which, however, I do not propose here to enter, since

the phenomena are the same, whether the carditis be the effect of rheumatism or any other cause; and this may also be said of any of the other serous membranes when they happen to be involved. Rheumatic meningitis is, happily, rare, and I have only seen one well-marked case of it, which proved fatal.

But there are other dangers besides those attending carditis or meningitis. Every now and then—fortunately not often—rheumatic fever assumes a form for which I think the term “malignant” is the most appropriate. In such cases, without any apparent reason, the temperature begins to rise, and may ultimately attain the height of 110° Fahr., or even more; the joint affection subsides, pain is no longer complained of, and the patient often expresses himself as better just as the most serious symptoms are coming on. The profuse sweating ceases, the skin becomes dry, harsh, and intensely hot to the touch; very frequently a crop of sudamina breaks

out upon the neck, chest, and abdomen,* the tongue becomes dry and brown, there is great thirst, complete loss of appetite, the breathing is rapid, the pulse very quick and generally weak, the patient is tremulous and restless, with a suffused and "ferrety" appearance about the eyes, delirious at night, but often fairly sensible in the daytime. The delirium is generally of a low, muttering kind, not unlike that of delirium tremens, though occasionally there is some excitement. Unless the disease takes a favourable turn or relief can speedily be given, death ensues in a day or two, apparently from mere hyperpyrexia.

Pericarditis not unfrequently occurs in connection with hyperpyrexia; but it is by no means always present, and it does not seem to be necessary to the existence of the abnormal high temperature. When the two conditions are present in the same

* I have learned to look upon this as a very unfavourable sign.

case, the pericarditis, like the joint affection, often passes into abeyance.

I am aware that high temperature is not peculiar to rheumatic fever—that it may arise in continued fevers, in diseases of the brain and spinal cord, in pneumonia, and other disorders; but it is in acute rheumatism that it has attracted most attention, and is most frequently encountered. Curiously enough it is not only the more severe attacks of the disease that drift into hyperpyrexia; comparatively mild and sub-acute cases, which appear to be doing well, will now and then take this remarkable course.

I use the term “malignant” for this condition in the same sense that it is used for those terrible cases of smallpox, scarlet fever, or cholera, in which the chief force of the disease seems to fall upon the nervous system, overwhelming the patient; and I think it not unlikely that the hyperpyrexia of rheumatic fever is in some way connected with the implication of the nervous system in the specific inflammation. Certainly

“malignant” is not too strong a term for these cases, for in my own experience and that of others the greater number prove fatal in whatever way they may be treated.

After a while, varying with the severity of the disease and the effect of the remedies employed, rheumatic fever tends to get well. The fever subsides, the inflammation in the joints disappears, and (if the heart has not been implicated) the recovery is generally complete; for, beyond some temporary relaxation of the synovial membranes and weakness of the joints, no ill effects are left behind. It is otherwise, however, when the heart has been affected, since although the recovery of the patient may appear to be complete, and he may think himself well, there is more or less permanent mischief left, which often leads to further trouble; and most of the severe cases of cardiac disease, with their train of hypertrophy, dilatation, congestion, dropsy, and death, are the legacy of acute rheumatism.

Probably we see more of rheumatic fever

in its sub-acute form than in any other, especially in hospital practice. I would call those cases sub-acute in which the temperature does not exceed 101° Fahr., or thereabouts, and in which only a few joints are affected, and the constitutional symptoms are comparatively slight. This form of the disease differs from the acute chiefly in degree, all the symptoms being less severe, and the liability to heart mischief not so great. But it is quite as tedious in its course as the more acute form, and relapses are not uncommon.

Chronic articular rheumatism is, I believe, not unfrequently confounded with other diseases of the joints. There is little or no fever or constitutional disturbance, and sometimes not more than one joint is affected. It may arise independently in persons with but a slight predisposition to articular rheumatism, or it may be the sequel of a more acute form of the disease. There is a good deal of swelling and some tenderness of the affected joint or joints, but

no redness, and not much pain when the patient is at rest, nor is there any marked sweating. The disease may last for some few weeks under ordinary treatment, but disappears rapidly when salicylate of soda is used.

Disease, like nature, delights in variety, and there is a curious and rare form of rheumatic fever, if one may so call it, in which there is no joint affection at all. Dr. Graves mentions having seen several such cases, and in persons who were liable to attacks of the ordinary articular form. I have met with but one instance, and that was some years ago. The patient, a lad of sixteen, had symptoms exactly resembling those of acute rheumatism, the fever, the constitutional disturbance, the profuse sweating, and peculiar odour, but no joint-disease whatever. In the course of ten days or so he got quite well.

CHAPTER IV.

THE PATHOLOGY, MORBID ANATOMY, DIAGNOSIS, AND PROGNOSIS OF ARTICULAR RHEUMATISM.

THE pathology of articular rheumatism is confessedly obscure and difficult. That the inflammation in the joints is not common inflammation, but due to the presence of some morbid material in the blood, is now pretty well recognised. What, then, is this morbid material? Is it introduced into the body from without, like the poison of small-pox or typhoid fever, or is it manufactured within the system, like the poison of gout? Is it exhausted or used up for a while by an attack of rheumatism, as happens in gout; or is it always present, but requiring from time to time a fresh application of the exciting cause? These are very interesting questions, but not easy ones to answer.

It is curious that Dr. Maclagan was induced to try salicin as a remedy for rheumatic fever, in consequence of a theory that the disease was malarious in its origin—a theory, however, that is scarcely borne out by the natural history of the disorder. We see that the liability to acute rheumatism is confined to a certain number of persons, many of whom have inherited their undesirable proclivity; and that cold is its chief, if not its only, exciting cause; which seem to indicate that the elements of articular rheumatism exist in the system of those who are predisposed to the disorder, ready to start into activity upon the application of the necessary stimulus. According to this view the pathology of rheumatic fever would more resemble that of gout than ague; and so it does to some extent. Both diseases may be inherited, both are liable to recur, there is a certain similarity in their symptoms, and each when left to itself comes to an end in a somewhat variable time. But here the resemblance ceases. Articular rheumatism is a disease of

early adult life, gout is most common after middle age. It is doubtful whether a predisposition to rheumatic fever can be acquired by vicious habits, improper food, or the abuse of wine and beer, which are such important factors in the production of gout. Dr. Garrod's researches have clearly shown us that the poison of gout is urate of soda; but up to the present time no examination of the blood, urine, or sweat in cases of rheumatic fever, has given any clue to the nature of its *materies morbi*. That it might be some acid seemed probable, and Dr. Prout suggested lactic acid. Dr. Richardson's experiments will, I dare say, be remembered. He injected a solution of lactic acid into the peritoneum of a cat and dog, and after death, in each case, distinct endocarditis was found. Dr. Silver has expressed himself very clearly on this subject in a paper read before the Clinical Society on the "Use of Veratrum Viride in Rheumatism." He says:—"It has been roundly asserted that the immediate cause of rheumatic fever is lactic acid—at all events

an acid of some kind. Were this so it would be folly to seek a remedy in *veratrum viride* or any other neurotic: neutralise the acid and the disease would cease. On this theory depends the alkaline treatment of rheumatism. Against its validity several weighty arguments may be adduced. In the first place, it has to be proved that life is possible with an acid blood. In the second, admitting a blood poison of an acid kind, its effect might be expected to be equally visible on both sides of the heart; but we know that the right, not differing from the left in intimate structure, is not attacked, while the left is so frequently. But it is especially in its application to practice that the theory fails us, for we may admit the alkaline treatment to be in a certain degree successful, and yet reject its supposed basis. Nay, did the theory and practice exactly coincide, it is plain that the disease should be arrested, except in so far as the pathological processes already set up were concerned, as soon as the blood resumed its normal alkalinity—that is, before the urine

became alkaline. Yet it is a matter of experience that the disease may go on days and weeks after that event" (*Trans. Clin. Soc.*, vol. iv., 1871).

Thus in the face of the very doubtful benefit obtained by the alkaline treatment in rheumatic fever, and the marvellous results obtained from salicylic acid, it is difficult to believe that the essence of the disease can be an acid at all, though its operation may in some way produce great acidity.

We may hope that one day something will be ascertained with regard to the poison of acute rheumatism, but it must be remembered that we are still entirely ignorant of the morbid matter that exists in the blood in many, indeed most, of the specific diseases. No analyses, no investigations, have led to the discovery of what causes small-pox, measles, or typhus fever; nor are we able to isolate the subtle marsh poison that produces remittent and intermittent fevers. All we know of them is from their effects upon

the human body, and it may be this is all we shall ever know of the morbid material that produces rheumatic fever. Whatever it may be, it is a remarkable fact that it exists, or is in a state of activity, only during a certain period of life, but of the reason for this we are quite ignorant.

The drenching sweats, with their peculiar odour, suggest that the poison of rheumatism may be eliminated by the skin, and such a view is strengthened by the fact that the cessation of these sweats often precedes, and always accompanies, the unfavourable forms of the disease.

The morbid anatomy of rheumatic fever throws no light on its pathology.

It is not often that we get an opportunity of investigating the condition of the joints during an attack of the disease. Every now and then, however, a case proves fatal, through the occurrence of severe cardiac mischief or hyperpyrexia, and then we find that the affected joints are more or less vascular, especially about the synovial fringes, and coated

with a sticky, altered synovia. Sometimes there is actual effusion, more often not, because the joint mischief is apt rapidly to subside upon the supervention of fatal complications. No ulceration of the cartilages takes place in true articular rheumatism, even after repeated attacks of the disease (Garrod). When death has been caused by heart disease, or any other complication, the post-mortem appearances will be in accordance.

After death from hyperpyrexia, we may or may not find pericarditis. I should say that it will be present in about half the number of cases. Besides the morbid changes due to the heart disease, if it exist, the appearances after fatal high temperature are the following:—The brain and meninges are rather vascular, the lungs are dark and congested, the liver and spleen friable and easily broken down, and the kidneys apt to be congested. The blood is tarry and fluid, but the muscles are remarkable for their bright red colour. The odour of such cases, even when recently examined, is most offensive.

The diagnosis of articular rheumatism is not generally very difficult. We may take into consideration, in forming our opinion, the probabilities of the case as well as the actual symptoms. Thus, the age of the patient, a previous attack of rheumatism, a history of exposure to wet and cold, will help us to arrive at a conclusion. The symptoms of acute rheumatism may be mistaken for those of acute gout, of acute rheumatoid arthritis, of pyæmia, and of gonorrhœal rheumatism. With the exception of pyæmia, the constitutional symptoms of acute rheumatism are much more severe than in the other disorders. The copious sweats, with their peculiar odour, the number of joints affected, and the tendency to metastasis and heart disease, are all very characteristic of rheumatic fever, as is also the trivial injury to the affected joints, which are so damaged in pyæmia and in gonorrhœal and rheumatoid arthritis.

The sub-acute and chronic forms of articular rheumatism somewhat resemble chronic gout, chronic rheumatoid arthritis, and other

chronic joint affections; but a careful study of the disease, with its history, will generally clear up any doubt as to the nature of the attack.

Were it not for the liability to heart disease, with its present and future dangers, and the possible occurrence of hyperpyrexia, the prognosis in rheumatic fever would be very favourable. As it is, but few patients die of it directly, and none from the mere joint disease. But if the immediate perils of cardiac complications or high temperature are escaped, the former too frequently leaves permanent mischief, which subsequently proves fatal. The prognosis, therefore, in rheumatic fever, must of necessity be guarded; not, indeed, so much with reference to its immediate, but to its remote effects. Heart disease is more liable to occur in children than in adults; hyperpyrexia in adults than in children. In the chronic forms of true articular rheumatism, the prognosis is very favourable.

CHAPTER V.

THE TREATMENT OF ARTICULAR RHEUMATISM: BY ALKALIES
—BY QUININE—BY OTHER DRUGS—LOCAL TREATMENT
—SALICIN—SALICYLIC ACID AND SALICYLATE OF SODA—
THEIR VALUE—HYPERPYREXIA.

THE treatment of rheumatic fever has lately undergone a complete revolution, which has happily placed it on a much more satisfactory footing.

But a short time ago, a tolerably severe case was pretty sure to last six or seven weeks, almost uninfluenced by the remedies employed. Some put their faith in alkalies, some in quinine, some in various drugs, and some did nothing, with very much the same result.

Sir William Jenner himself, when President of the Clinical Society, spoke of the doubt and uncertainty with which he used to ap-

proach the treatment of articular rheumatism under the old *régime*.

It has been claimed for the alkaline treatment that it diminished the liability to heart mischief, but about this there is, I think, some doubt. If, however, it is thought desirable to try it, from fifteen to thirty grains of the bicarbonate of potash, with or without five grains of the nitrate of potash, may be given in some peppermint water, or other suitable vehicle, every four hours, or three times a day. The potash produces no disagreeable effect, and may be continued for any length of time. It always diminishes the acidity of the urine, and sometimes makes it neutral, or even alkaline. Under this treatment, which I have seen largely used, the disease will take its departure in from three to six weeks or more, according to the severity of the case and the tendency to relapse.

Let me here say that in all cases of articular rheumatism of an acute or sub-acute form, it is necessary that the patient should be kept in bed, with warm but light

clothing, in a well-ventilated room, the temperature of which should be about 64° F. The bowels, which are generally constipated, must be kept gently open; but it is needless to purge for mere purging sake, especially as the movements necessitated by any action of the bowels are attended with considerable pain in severe cases. The diet should be light, consisting chiefly of slops. Stimulants are not necessary as a matter of course, but will be required every now and then, and must be administered with tact and judgment. As the disease is an exhausting one, it is well to feed up the patient in reason as soon as good nourishment can be taken.

My late colleague, Dr. Hyde Salter, was in the habit of using quinine in the treatment of rheumatic fever, and I have had many opportunities of observing the result, but without coming to the conclusion that the drug had any real influence over the disease.

Dr. Garrod has combined the quinine and

alkaline treatment, using a mixture made by rubbing up the quinine with bicarbonate of potash, a little mucilage, and some aromatic tincture, in such proportions that each ounce and a half of the mixture contains five grains of quinine (in the form of carbonate) and thirty grains of bicarbonate of potash. This dose is given to an adult every four hours, and continued as long as may seem desirable. Dr. Garrod speaks favourably of this combination.

Iodide of potassium has been a good deal used in rheumatic fever, and though of but little use in the height of the disorder, it is often of service later on, helping us to "speed the going guest." Guaiacum is another drug which is sometimes successful in relieving the pain of the joints in the more chronic forms of articular rheumatism.

Of the treatment of rheumatic fever by bleeding, mercury, colchicum, antimony, it is unnecessary to say more than that modern experience has found such agents powerful

only for evil; but opium* is often most useful, alleviating the pains in the joints, and enabling the patient to get some sleep. In cases where there is pericarditis opium is of the greatest service.

Reference must be made to the external means of treating or assisting the treatment of articular rheumatism. Of these the chief are, the hot-air bath, and the application of alkaline lotion, cotton wool, iodine paint, or blisters, to the inflamed joints. The hot-air bath has seemed in some instances to relieve pain, and its diaphoretic effects may be of service in eliminating the morbid material of the disease. But in a complaint like rheumatic fever, where the temperature is liable to range high, the application of external heat cannot be made without some risk, and the permanent benefit appears to be doubtful. Besides which the excessive pain that attends any movement in

* Under the term "opium" I include, of course, morphia and its salts, which may frequently be used with advantage hypodermically.

the height of the disease would make it difficult, if not dangerous, to apply the remedy. The application of warmth, however, to the affected joints individually is mostly grateful to the patient, and wrapping them in cotton wool or flannel generally relieves the pain. The use of an alkaline lotion may prove beneficial in some cases. Blisters or iodine paint are scarcely applicable in the acute stage of the disease, but are often of service subsequently, by hastening the absorption of any fluid that may linger in the joints, and toning up the weakened parts. Blisters should be applied a little above the affected joint rather than over it; and iodine paint must be used with caution, as in certain persons it produces such an inflammation of the skin as amounts almost to erysipelas.

Towards the end of any case of rheumatic fever, no matter what the previous treatment has been, tonics are required; and nothing answers better than a combination of steel and quinine, or steel and strychnine.

Up to a few years ago little could have been added to the foregoing sketch of the treatment of articular rheumatism; but in 1874 Dr. Maclagan struck the key-note of a better mode of treatment, which has since been followed up with the greatest success. This physician published a paper in the *Lancet* (March 4 and 11, 1876), "On the Treatment of Acute Rheumatism by Salicin," from which it appeared that having been struck by some analogy between that disease and intermittent fever, Dr. Maclagan conceived that acute rheumatism might be of malarious origin, and receive benefit from the alkaloid derived from willow bark.

Without entering into any discussion of the theory which led to the experiments, there is no doubt that they were more or less successful, Dr. Maclagan detailing several cases of true rheumatic fever which, under the use of salicin, became convalescent, on an average, in four days. The first case treated was in November, 1874, and there is no doubt that Dr. Maclagan was the first

person to draw attention to the value of salicin in rheumatism. Subsequently to the publication of the paper in the *Lancet*, large numbers of cases of the disease were treated with salicin, but with somewhat varying results, and in my own cases, I confess, without much success. The dose given was generally from twenty to thirty grains, or more, every two, three, or four hours, and large amounts were required before much benefit was obtained. Such was the demand for salicin that the price of the drug rose from 1s. 6d. to 10s. or 12s. an ounce; and at one time there was an absolute famine, and wholesale dealers would quote no price for it.

In the meantime German physicians had been trying the effect of the derivatives of salicin—salicylic acid and the salicylate of soda. The second number of the *Lancet*, of January, 1876, contains a notice of the observations of Dr. Reiss, in the Berlin Metropolitan Hospital, on the use of salicylate of soda, chiefly in regard to its action in redu-

cing abnormal temperatures. Now, although salicylic acid and its soda salt may be valuable antipyretic agents in many cases of high temperature, independently of the nature of the disease, it was more particularly in the hyperpyrexia of rheumatism that they were used. As a result of this it soon became apparent that they exercised a great control over the disease. This led to the extensive use of salicylic acid and the salicylate of soda in ordinary cases of rheumatism, and with the most satisfactory results. Some observers preferred the acid, some its soda salt. It is probable that the salicylic acid is the active agent in either case, just as the iodine is the active agent in iodide of potassium; but crude iodine is seldom given now, and in a short time I believe the salicylate of soda will be used in all cases where the action of salicylic acid is desired internally. It is very soluble, which the acid is not, and it is far less liable to give rise to unpleasant symptoms. I give the preference most decidedly to the soda salt as at present advised, though it is quite

possible, indeed likely, that combinations of salicylic acid with potash, ammonia, and iron, may turn out to be very valuable. In experimenting with salicylate of soda, it was of course desirable that the drug should be used alone, lest there should be any question as to the results. And there was no difficulty about this, as the salt is freely soluble in cold water, and not very disagreeable to the taste. Subsequent experience, however, has shown the advantage of giving the drug in combination, and I now commonly order two or three grains of carbonate of ammonia with the salicylate in an ounce of camphor water. Some tincture or syrup of orange may be used instead of the ammonia and camphor, and in that case orange flower water makes a very agreeable vehicle. Where there is intense acidity some alkali, five or ten grains of the bicarbonate of potash, is a very useful addition. The dose of the salicylate of soda will vary from ten, fifteen, or twenty grains, every two, three, or four hours, according to the severity of the symp-

toms. As a rule, the good effects of the drug are apparent after eight or ten doses, though it may be two or three days before the full benefit is obtained. The temperature falls rapidly to normal, or even a little below, the pain, redness, and (later) the swelling of the joints disappear, and the patient is practically convalescent in a few days. It is important, however, to keep up the action of the remedy for a week or so, as relapses are liable to occur if it be discontinued too soon; but smaller doses at longer intervals may be given, and at this stage it may be advantageously combined with the ammoniated tincture of quinine. In very rheumatic subjects it will often be necessary to give the salicylate again and again before the disease is subdued, and these cases have been used as an argument against its efficacy. Some persons will not admit the value of mercury and iodide of potassium in the treatment of syphilis, and others question the protective power of vaccination against small-pox. All new remedies have to encounter opposition and

prejudice, but the evidence in favour of salicylate of soda in the treatment of articular rheumatism is becoming so overwhelming, that its great value must shortly be thoroughly established. No doubt every now and then the drug produces disagreeable symptoms—sickness, deafness, tinnitus aurium, and sometimes a peculiar cerebral disturbance; but these quickly vanish on a discontinuance of the medicine, leaving no ill effects behind, and seldom reappear upon the resumption of the salicylate after a short interval. These unpleasant symptoms are much less common now than formerly—indeed they are rarely met with; and this is probably due to the greater purity of the salt. Dr. Murchison has suggested, in an able paper read at the Clinical Society in May, 1877, that the disagreeable effects of the remedy are due to the suppression of the function of the kidneys, and he has found albumen in the urine of patients who were taking the salicylate of soda, even when the drug was quite pure. This may be so, but up to the present time I

have in no instance been able to detect albumen in the urine of those who were under the influence of the salicylate.

A case of "acute rheumatism, followed by necrosis of the tibiæ and left radius during treatment by salicin and salicylic acid," was published by Dr. Herbert Lilley in the *Lancet*, of October 27, 1877; but with regard to this case I may quote a portion of a leading article in the same journal (November 3, 1877) with which I entirely agree. The writer observes that:—"Necrosis of bone does not appear to have complicated cases of rheumatism under this treatment, and it is possible that in Dr. Lilley's case the necrosis may have been in some measure connected with the strumous habit of the child." That the use of salicylate of soda in acute rheumatism does not prevent the possibility of cardiac complication is unfortunately pretty clear; but it lessens the chance of its occurrence by controlling the disease.

With reference to the forms of articular rheumatism to which the salicylate treatment

is most applicable, I would say, to *all*. It has been suggested, I am aware, that sub-acute and chronic cases—cases in which the temperature does not exceed 101° F. or thereabouts—are less influenced (if at all) by the drug than the more acute forms, but to this I cannot agree. It has appeared to me that the sub-acute and chronic kinds of articular rheumatism are quite as favourably influenced by salicylate of soda as the more severe forms, and in this view I am glad to be confirmed by Dr. Cavafy.

It must be borne in mind that the salicylate is not an absolute specific for rheumatism—that it fails to relieve, or cannot be tolerated, every now and then. But this is no more than what happens with quinine in ague, or iodide of potassium in syphilis.

In cases of hyperpyrexia the drug seems to produce little or no effect. This is the more curious that it was originally introduced as a remedy for high temperature.

With regard to the treatment of hyperpyrexia, when once that condition has been

established, but little that is satisfactory can be said. It is most disappointing that in these severe cases, where most we want its aid, the salicylate of soda should help us so little. It probably does something to diminish the chances of hyperpyrexia, as it does those of cardiac mischief, by cutting short the rheumatism, but more than this can scarcely be said for it. In this "malignant" form of rheumatic fever no remedies seem to have much permanent effect. All drugs are more or less useless, and we are driven into trying to reduce the temperature by means of the cold bath, the cold douche or affusion, or packing in wet sheets.* In a certain small number of cases one or

* In cases where ice is not used, the patient's body and limbs are wrapped closely in a single sheet, which has been previously wrung out of cold water (temp. 50° to 60°). A blanket is then thrown loosely over him, and he is allowed to remain undisturbed for about half an hour, when the same process is gone through again, and repeated until the temperature is sufficiently reduced. When the ice pack is employed, a hip bath or other suitable receptacle containing a few gallons of water, in which some large pieces of ice are floating, is kept by the patient's bedside, and his body and each limb is separately wrapped in pieces of old

other of these remedies has been attended, or followed, by favourable results; but we must remember that hyperpyrexia, though a most perilous condition, is not inevitably fatal. Dr. Cavafy has recorded a case in which recovery took place under careful feeding and the judicious use of stimulants only. We must also bear in mind that the reduction of the temperature by cold is not unattended with danger. If it be thought desirable to try the application of cold in the hyperpyrexia of articular rheumatism, it should be done with the greatest care and judgment.

“There is no doubt that patients are often temporarily benefited by this treatment in a remarkable degree. It is less certain that their ultimate recovery is materially promoted by it.”*

sheeting, which have been wrung out of the iced water, each piece being renewed as often as it begins to feel warm to the hand. No other covering of any kind is put over the patient. In this way the temperature may be very rapidly reduced, and it is necessary to be careful that it is not brought too low. It should not be allowed to fall below 99° F.

* Bristowe: “Theory and Practice of Medicine,” 2nd Edition, 1878.

CHAPTER VI.

MUSCULAR OR FIBROUS RHEUMATISM—ITS FORMS AND CAUSES.

MUSCULAR rheumatism, although a common and painful disease, seems scarcely to have received the attention which its importance deserves; certainly the accounts of it in medical works are comparatively scant and meagre. And yet as a disease it has much interest, notwithstanding that it does not appear to shorten life in any way;* and intractable as it often is, much may be done to alleviate, if not to cure, the discomforts to which it gives rise. The disorder is met with in various forms, of which perhaps the best known are lumbago, stiff neck, and intercostal rheumatism;

* Neither the heart nor any other important organ is liable to be attacked in this disease.

but there is scarcely a muscle in the body that may not be affected by it. Although I adhere to the old term "muscular" rheumatism, I have already indicated that the mischief, whatever it is, seems to be situated in the fasciæ or tendinous extremities of the muscles, rather than in the muscular tissue proper. And we find in consequence that the seat of the pain is round and about the joints and the insertions of the muscles. Rheumatism, moreover, is not confined to the fibrous tissue in connexion with muscle. It attacks the periosteum sometimes, the sclerotic coat of the eye, and other parts.

It is commonly met with as a chronic disease, but may be acute in form, in which case, however, it is but rarely attended with any fever, the term acute applying rather to the duration and the pain, which is often most severe.

The chief factors in the production of muscular rheumatism are, (1) some morbid condition of the blood, the result of mal-assi-

milation, (2) some strain or over-exertion, and (3) cold, or wet and cold.

Probably the first stands in the relation of a predisposing cause to the other two, but when sufficiently strong it seems able to induce an attack of rheumatism by itself.

Another predisposing cause is a continued excessive or over-use of the muscles, and hence we find that rheumatism is the bane of acrobats, athletes, and agricultural labourers. I make a distinction between mere myalgia, the pain of tired muscles, and true rheumatism. The former has been well described by the late Dr. Inman, of Liverpool. Its seat appears to be in the sarcous elements themselves, the fleshy part of the muscle being the most painful. Akin to this and differing also from rheumatism are the pain and stiffness that follow any unusual exercise of the muscles. This is familiar to all, but is a matter of some interest, as it occasionally gives rise to false alarms.*

* Many years ago the late Mr. Headland was called in to see a young lady, a relative of my own, who was

There is no doubt, however, that a severe strain will give rise to lumbago, but probably only in those who are of a rheumatic diathesis. That wet and cold, or cold alone, will produce rheumatism scarcely needs any illustration. It is the most common obvious cause of the disease.*

Men are more liable to rheumatism than women, probably from being more exposed to the influences that conduce to the disorder. The time of life during which it is most common is that which is called the "prime," but it may arise at any time between puberty and old age.

supposed to have some severe inflammation about the abdomen. It turned out, however, that there was no fever, and the pain was in the muscles; the result of somewhat vigorous exertions in a swing the day before.

* Certain atmospheric conditions will often aggravate chronic rheumatism, especially the prevalence of dry, cold, east winds—probably by interfering with the action of the skin.

CHAPTER VII.

THE SYMPTOMS OF MUSCULAR RHEUMATISM.

THE symptoms of muscular rheumatism are almost entirely subjective, and pain is the chief, if not the only one. In an acute attack of lumbago, the patient feels as if he were suddenly gripped across the loins, and the slightest movement that involves the muscles of the back gives rise to the most acute pain. The recumbent posture is comparatively easy, but any attempt to turn from side to side produces great suffering. In severe cases locomotion is all but impossible, and the patient is of necessity confined to his bed. Not unfrequently rheumatic pains will shoot down the legs from time to time, affecting even the periosteum of the tibiæ. There is, however, neither swelling nor tenderness, ex-

cept perhaps just over the seat of the pain in the back. Along with these symptoms the patient does not feel ill—the pain is his only trouble. The bowels may or may not be confined, but the condition of the urine is of some interest. In a large number of cases it will be found pale and clear, looking, in fact, as if there were nothing wrong with it, and unless the weather be cold it will probably throw down little or no precipitate on cooling. But if this pale clear urine be tested it will be found *intensely* acid. As the attack passes off the urine becomes of a darker colour, and loaded with lithates, generally of a reddish tint. In fact, this change in the urine is often the precursor of recovery. Should the case be treated with alkalies, this alteration in the character of the urine is less marked, or altogether absent.

An acute attack of lumbago may last from a few days to two or three weeks, or even longer.

In chronic cases, which are often the sequel of the acute, the pain is much less, and

scarcely felt unless the muscles of the back are somewhat strained; but there is always a feeling of weakness, and a sort of constant reminder that a very little would bring on an acute attack. The subjects of chronic lumbago are always conscious of having a back, and if careless about diet, lifting some heavy weight, or exposure to cold, are very likely to get a sub-acute exacerbation of their complaint.

When rheumatism affects the muscles of the neck it is usually more or less acute. After some incautious exposure to cold, such as sitting with the back to a draught, the sterno-mastoid or some other muscle becomes stiff and painful on one or other side, and the patient keeps his head turned towards the affected side (*torticollis*) to relieve the pain. This form of the disease usually passes off in a few days.

Intercostal rheumatism is also generally acute in character. It gives rise to great pain during respiration, and any other movements that affect the wall of the chest. It

not unfrequently creates a false alarm of pleurisy. The muscles about the shoulder or hip joints are very frequently affected with rheumatism, more or less chronic in character, and causing considerable pain on certain movements.

Rheumatism often attacks the muscles of the head, producing a dull aching pain just above one or other eyebrow or at the occiput. This is the result generally of exposure for some time to a cold wind. Associated with this rheumatism of the head, but sometimes occurring quite independently, is rheumatic inflammation of the sclerotic. Here there is marked congestion of the sclerotic coat of the eye, usually seen as a red patch, rather circular in form, situated on the outer side of the cornea, and rendered plainly visible by getting the patient to turn the affected eye inwards. The eye feels stiff and painful, it is also rather tender; and certain movements, such as turning the eyeball outwards and upwards, much aggravate the pain.

In the course of a day or two the inflammation subsides, but is very liable to return.*

Amongst the occasional symptoms that accompany muscular rheumatism we often find more or less dyspepsia. This is not surprising when we remember that mal-assimilation is a prominent cause of the disorder. Some rheumatic subjects are liable to lowness of spirits—a wretched kind of feeling—between the attacks, which is generally relieved by an outbreak of the disease. Here we have a certain resemblance to gout, and additional evidence in favour of muscular rheumatism being a blood disorder.

Although an over-acid state of the urine is most common in rheumatic attacks, I have seen several cases in which the opposite condition was present. In these the urine was

* I know a gentleman who for some years was troubled very severely with this form of scleratitis. He had the best advice for it, but in spite of everything it returned again and again. At last the disease seemed to wear itself out, and he rarely has an attack now.

nearly neutral, and became cloudy with phosphates on being boiled. The rheumatism departed as soon as, but not until, the urine became normally acid.

CHAPTER VIII.

THE PATHOLOGY, DIAGNOSIS, AND PROGNOSIS OF MUSCULAR RHEUMATISM.

IF the pathology of articular rheumatism is obscure, so also is that of the muscular form. Judging by what we see when the sclerotic is affected it is not unreasonable to assume that parts affected by rheumatism are more or less congested. A violent strain may possibly account for the condition in those cases where the rheumatism is due to that cause, and the effect of cold may produce the same local hyperæmia, but some morbid state of the blood seems to be essential for the production of a rheumatic attack, and what that morbid state is we do not know. It certainly does not seem to be the same as is associated with the articular form.

The acid condition of the urine that is so frequently present, and the value of alkalies in the treatment, would indicate the probability of some acid being the *materies morbi*, but more than this we cannot say. If lactic acid were the cause of any form of rheumatism we might expect that disease to have been freely developed in the experiments of Dr. A. Auerbach, who has lately been giving large doses with the view of producing sleep, but it is not recorded that any rheumatism resulted.* The pathology of muscular rheumatism, then, is still involved in great obscurity, and of its morbid anatomy we literally know nothing.

The diagnosis of rheumatism can rarely be difficult, when all the circumstances of the case are taken into consideration, but we must be careful to discriminate between lumbago and renal calculus or an attack of gravel; and between pleurisy and intercostal rheumatism.

* See annotation on the "Action of Lactic Acid" (*Lancet*, March 16th, 1878, page 397).

The prognosis of muscular rheumatism is always favourable as far as life is concerned, but it must be borne in mind that the disease is very intractable, and liable to return again and again.

CHAPTER IX.

THE TREATMENT OF MUSCULAR RHEUMATISM.

IN dealing with the treatment of muscular rheumatism, it will be convenient to consider first what measures may be best adopted during an attack, and secondly what precautions should be taken with the view of avoiding the disease. During an attack of rheumatism the best results will be obtained by careful attention to all those matters which are more or less connected with the production of the disease, and hence we may subdivide the treatment into general, dietetic, and the use of drugs internally and locally.

The general treatment is of no small importance, and amongst other things rest—rest to the painful muscles—must be enjoined when the disease is acute and severe. You

cannot "walk off" a sharp attack of lumbago. It may even be desirable to keep the patient in bed. Any way he should be in a warm room, with an even temperature, and warmly but lightly clad. No material is so anti-rheumatic as flannel, and it is popularly supposed that unwashed red flannel is the best. It is desirable that the bowels should be freely opened at the onset, and kept regular subsequently, if needed, by Friedrichshall or Pullna water.

The diet should be light and simple, and any articles of food likely to create dyspepsia should be especially avoided. The same amount of stimulant may be allowed as is taken during health, but beer in any form is inadmissible; and amongst wines, champagne, sparkling hock or moselle, are about the worst. The safest stimulant is whisky and water, but there is no objection to claret, or perhaps a little dry sherry.

With regard to the use of drugs internally, it must be remembered that there is no specific for muscular rheumatism—nothing

that answers to the salicylate of soda in the articular form *—and before giving any medicines it is most important that the condition of the urine should be ascertained.

It will generally be found too acid, and in such cases we shall certainly do good—sometimes actually cure the patient—by the administration of alkalies. Of these, the best is usually the bicarbonate or the citrate of potash, and either may be combined with carbonate of ammonia or the liquor ammoniæ acetatis. Occasionally the iodide of potassium is of service. When the digestion is obviously at fault, a few grains of rhubarb should be given with the alkali, and the lowering effects of the potash may be lessened by giving it in some bitter infusion.† The very reverse of this treatment must be adopted in those cases of rheumatism in which the urine,

* I have given the salicylate a very fair trial in muscular rheumatism, but unfortunately with only negative results.

† In certain cases a few large doses of alkali are better borne than a number of small ones.

instead of being very acid, is neutral or nearly so. This is a low form of the disease, occurring in pallid, weakly individuals, and the great point in the treatment is to restore the natural acidity, and nothing affects the rheumatism until this is done. Now it is not difficult to render acid urine neutral, but it is not so easy to make neutral urine acid. The best plan is to give rather large doses of mineral acid freely diluted after meals, and to get the patient to drink a kind of lemonade made with nitric acid instead of lemon juice. As soon as the urine becomes natural the rheumatic pains abate, and are quickly got rid of entirely. As recovery takes place a decided tonic form of treatment should be adopted, and quinine or strychnine, with or without steel, will be found useful.

In the local treatment of rheumatism the application of external warmth is very efficacious, and the hip-bath or hot-water fomentations often give great relief. As a sedative belladonna alone or in combination with opium

frequently deadens the acute pain, and may be used in the form of a belladonna plaster or as a liniment

In the more chronic forms of muscular rheumatism we should attend to the general health, and insist upon a certain amount of exercise amongst other things.* Here alkalies are of more doubtful benefit, and many persons cannot tolerate them for any time. The greatest care and attention to the diet will be necessary, as the least imprudence is often followed by an increase of the rheumatic trouble. When there is no decided acidity some dilute mineral acid with strychnine or calumba, and perhaps some perchloride of iron, may be given with advantage after meals. Guaiacum is a drug that has a great reputation in chronic rheumatism, and the ammoniated tincture is the best preparation. It may be given with cinnamon water, which conceals, to some extent, its nauseous and burning taste. Where there is no reason to the contrary a Turkish bath may

* Over-fatigue, however, must be carefully avoided.

be tried, but I have no great confidence in it myself.

Mere rubbing, if skilfully performed, is frequently useful in rheumatism, and there are professional rubbers who make a livelihood in this way. Galvanism, too, has been tried in chronic cases, or when the acute stage has passed away, with more or less success.*

A visit to Buxton or some of the German watering places is often attended with benefit in chronic rheumatism; the change of air and scene contributing possibly as much as anything else to the improvement of the patient.

In rheumatism of the head, and that which affects the sclerotic, a vigorous alkaline treatment is generally the most successful, and as a local application to the affected eye nothing is so serviceable as a weak solution of atropine.

To avoid muscular rheumatism we must shun those things that produce it. Hence

* These remedies probably act by improving the circulation in the affected parts.

it is most important to attend to the general health, and especially to the digestive organs. Straining the muscles in any way is very injurious, and liable to bring on an attack of the disease, especially lumbago. Exposure to wet and cold, or to cold only, should be avoided as much as possible; and those who are subject to rheumatism will do well to wear flannel, or some other warm material, next the skin all the year round. It is very useful to have an extra pair of drawers made of red flannel to wear over the ordinary ones in the winter; and an under waistcoat of the same material with long sleeves is a great comfort in cold weather. The cold bath in the morning, or cold bathing at any time, invigorating as they are to many persons, cannot be taken constantly during cold weather by those who are liable to rheumatism without considerable risk of bringing on an attack.* A tepid bath is free from any objection.

* A patient of mine once brought on an atrocious attack of lumbago by sitting for ten minutes or so in cold water with the idea of benefiting external piles.

The best beverage for those who are liable to rheumatism is, I am quite satisfied, a good wholesome claret. Most other wines are more or less rheumatic according to the peculiarity of the individual, and beer can very rarely be indulged in, especially if the occupation be sedentary.

CHAPTER X.

THE CHEMISTRY OF SALICIN, SALICYLIC ACID, AND THE
SALICYLATE OF SODA—THEIR MODE OF ACTION.

SALICIN was discovered by Leroux in 1830. It is contained in the bark of several species of willow and poplar, and in the flowers of the *Spiræa ulmaria* (meadow sweet). It may also be produced artificially.

Salicin is a white crystalline substance with a strong bitter taste, not unlike quinine. It dissolves pretty freely in water, less readily in alcohol. When salicin is taken internally, salicylic acid and salicylol are found in the urine, together with unaltered salicin, if the dose be large. The amount of salicin usually given varies from 5 to 20 grains, but it has been given in much larger doses in acute rheumatism.

Salicylic acid may be prepared from the oil of winter green (*Gaultheria procumbens*), which is mainly composed of salicylate of methyl. From this source an acid of great purity may be obtained, but at some considerable expense.

Recently Professor Kolbe has introduced a plan by which salicylic acid can be produced artificially from sodium phenol. This is prepared by dissolving crystallised phenol (carbolic acid) in a strong solution of commercial soda, in the exact proportions of the molecular weights. It is then evaporated to dryness in iron vessels, the pasty mass being finally heated over a flame, stirred all the while. Sodium phenol is thus produced, which is then heated in a retort to 100° C., a slow stream of carbonic anhydride (carbonic acid) is passed through the apparatus, and the temperature after some hours is raised to 180° . Phenol then distils over, the temperature being gradually increased to 220° — 250° , and the operation is complete when no more phenol passes over. Half the

carbolic acid united to the soda combines with the carbonic acid to form salicylic acid, which remains united with the soda, and the remainder of the carbolic acid (phenol) distils off. The resulting rough salicylate of soda is decomposed by hydrochloric acid, and the salicylic acid thus separated is purified by suitable recrystallisations.

Mr. Williams has pointed out that there are many practical reasons why, when salicylic acid is artificially prepared in this way, the resulting product should not prove uniform. The carbolic acid employed is of varying constitution, and, being a product of coal tar, cannot be obtained absolutely pure without great difficulty, and at an expense that would bring the salicylic acid almost up in price to that obtained naturally from the oil of winter green. Mr. Williams finds that in the artificial acid there exists another substance, varying in amount from 15 to 25 per cent. He is not quite clear at present as to its nature, but suggests that it is derived from the cresylic acid, which

is always present in greater or less quantity in commercial phenol, and would call it cresyl-salicylic acid, until a better name can be found. The presence then of this other product, and the possible contamination with carbolic acid, must be taken into consideration when we are giving the artificial salicylic acid or its soda salt; but, practically, I do not find that there is any objection to their use when carefully prepared. Salicylic acid should be white, or nearly so, free from smell, and crystalline; but the crystals of the artificial kind are small and indistinct as compared with those obtained from the natural source. The acid is but slightly soluble in cold water, more so in hot water, and still more in alcohol. It has a sweetish sour taste, and produces irritation in the throat.

Salicylate of soda for medicinal purposes is prepared by saturating salicylic acid (the natural or artificial) with carbonate of soda. The resulting salt is crystallised out of a menstruum containing about a third of

alcohol, as the crystals do not form well from a mere aqueous solution. Salicylate of soda should be white and odourless. It has a sweetish-bitter, slightly burning, or acrid taste, and is freely soluble in cold water.

Salicylic acid and its soluble salts give a deep purple colour with ferric salts, due to the formation of salicylate of iron. When taken internally they rapidly find their way into the urine, partly as salicylic acid, partly as salicyluric acid, and may be detected by the iron test within a quarter of an hour of being taken, and yet linger in the system so as to be present in the urine twenty-four hours after the discontinuance of the medicine.

Salicylic acid appears to act antiseptically, preventing fermentation and decomposition, probably from the readiness with which it is decomposed into phenol and carbonic anhydride; and being free from any disagreeable smell, it is much used externally for this purpose. The antiseptic properties

of salicylic acid are not shared, however, by its soda salt, and if the medicinal effect of the drugs be due to their antiseptic influence, the salicylate of soda probably liberates the acid in the system. This may happen through the agency of the nascent carbonic acid which is being constantly set free from the animal tissues, as pointed out by Professor Binz. According to this observer the gas is evolved in an absolutely pure state, and has the property of liberating the acid from the salicylate of soda. He illustrates this proposition by the following experiment:—A solution of the salt (1 per cent.) shaken up with ether yields nothing to it that gives a ponderable residue after evaporation. But if the same solution be treated at the ordinary temperature and under the ordinary pressure with carbonic acid, it will afterwards give up to ether from one-seventh to one-tenth of the salicylic acid originally in combination in the salt; and upon each repetition of the operation successive portions of the acid are

set free. The salt being much more soluble in water than in ether, remains in the former; but the acid being more soluble in ether than in water, the conditions are reversed, and when set free (presumably by the carbonic acid) it passes into the ether, from which it can be obtained by evaporation in fine crystals.*

Thus it would appear that salicylate of soda is decomposed in the system, and that its active element is probably salicylic acid; but how this acts in rheumatic fever we no more know at present than we know how quinine acts in ague.

* *Pharmaceutical Journal*, 11th November, 1876.

APPENDIX.

CASE I.

R. M., *æ*t. 28, was admitted into Charing Cross Hospital, under the care of Dr. Pollock, on January 4, 1877, suffering from acute rheumatism.

History.—The patient was quite delirious on his admission, and no account of his illness could be obtained from himself; but, according to his friends, it appears that he has been subject to rheumatism all his life, but never had rheumatic fever before, nor any other severe illness. The present attack began on December 28, with great pain in both knees. During the next few days other joints became affected, and he was admitted into the hospital as above. The disease is supposed to have been brought on by exposure to cold.

Present state: January 6.—Patient appears to be strong and well-nourished, and is healthy-looking. He is perspiring freely. Has no appetite, but is very thirsty. Respiration is quick, and his pulse very rapid—about 160. He is very delirious and restless, but will answer a question now and then. He evidently has pain in both knees and ankles, the left shoulder, and both wrists. The knees,

ankles, and right wrist are swollen. The tongue is dry and red, and has a baked appearance, very unlike the ordinary tongue of rheumatic fever. He is constantly putting his hands up to his head, as if there were some pain there. The bowels are constipated. The urine is pale, contains a trace of albumen, and a large quantity of lithates. There is nothing wrong with the lungs, and the heart's sounds are normal and clear, nor is there any oppression in the cardiac region.

Patient is on No. 1 diet, and has been taking—

Rx. Sodæ salicylatis, gr. xv.

Aquam, \bar{z} j.

every hour. Temperature on admission was 102° F., and went as high as 104° yesterday, and to-day has reached 103°.

January 9.—On the 7th the patient became much worse. His rheumatism disappeared, the sweating stopped, a crop of sudamina came out, and his temperature rose to 106·8° F. He was very delirious, and tried to get out of bed. Pupils much contracted. He was put into a cold pack, and rubbed with ice, which brought down the temperature to 101·2°; this was at 3 p.m. His temperature again rose, however, and between 11 and 12 p.m. he was again put in the cold pack, and his medicine altered to—

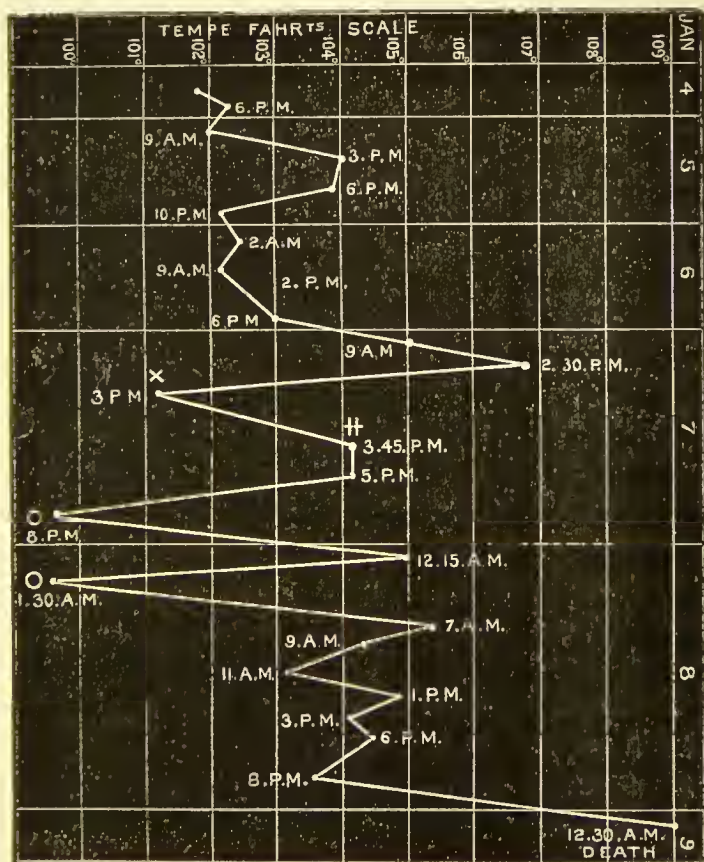
Rx. Sodæ salicylatis, gr. x.

Potassæ bicarb., gr. xx.

Aquam, \bar{z} j.

every three hours. Since the 7th he has had half an ounce of brandy every two hours.

Yesterday his temperature still kept up, and he was again packed, but without producing perspira-



tion. The skin was dry and burning, his teeth and lips were covered with sordes, and he tossed about

x In ice pack.

H After coming out.

o In ice pack.

in bed wild with delirium. About midnight stertorous breathing came on, his hands, and the muscles on both sides of the face twitched violently, and his temperature stood at 109° F. He was again packed, but died during the process, quite comatose, at 12.30 this morning.

Post-mortem examination, thirty-eight hours after death.—The body was well-nourished and muscular. None of the joints swollen, and the sudamina were very indistinct.

The heart was apparently quite normal. There was no disease of any valve; no fluid in the pericardium. The right ventricle was quite empty; the left contained a little blood-stained serum.

The right lung was congested, and there were evidences of old pleurisy. The left lung was also congested, but had no adhesions.

The abdominal viscera were congested, the liver and spleen especially engorged and dark-coloured. Their texture was softer and more friable than natural.

The brain appeared to be a good deal congested, but did not present any other morbid appearance.

Remarks.—The foregoing is a fairly typical case of “malignant” rheumatic fever, and illustrates how powerless the salicylate of soda is in such cases, and the merely temporary effect of reducing the temperature by external cold. It is an instance, also, of hyperpyrexia occurring quite independently of any cardiac affection.

CASE II.

T. M., *æt.* 19, was admitted into Charing Cross Hospital, under the care of Dr. Pollock, on January 6, 1877, suffering from acute rheumatism.

History.—The patient lives in the neighbourhood of Covent Garden, and is a shopman. Has never had rheumatism before, and there is no family history of the disease. Has been liable occasionally to bronchitis, but has otherwise enjoyed good health. His present illness began on January 2, when he came over in a cold sweat, and had a rigor that lasted about ten minutes. Shortly after he found his knees were stiff and painful, and on the 6th his ankles also became affected. He lost his appetite, became very thirsty, the bowels were constipated, and he felt so ill that he was brought to the hospital and admitted.

Present state: January 8.—There is pain in both knees, which are swollen, and the left ankle is also painful, but not swollen. The heart sounds appear to be quite normal, but yesterday there was some oppression over the cardiac region, and a mustard poultice was applied, with much relief. No friction sounds could be heard. Lungs normal. The temperature on admission was 103° F., but yesterday went up to 104·2°. To-day it has come down to 101°. Pulse 104. The tongue is coated; bowels constipated.

Has been taking since admission—

R. Sodæ salicylatis, gr. xv.

Aquæ, \bar{z} j.

every two hours.

January 12.—Since the last date the patient has improved; the temperature has gone down to about normal, and the joint affection is nearly well, but to-day he complains of pain over the cardiac region, and over the base of the heart pericardial friction can be heard. There is also a pleuritic rub about the left side. Mustard and linseed meal poultices were applied over the cardiac region. The patient is very deaf from the salicylate of soda.

January 15.—The medicine was changed to—

R. Tinct. digitalis, ℥ xv.

Tinct. opii, ℥ v.

Tinct. cinch. co., \bar{z} j.

Aquæ, ad \bar{z} j.—t. d. s.

but this not having much effect, on

January 20 he was ordered—

R. Sodæ salicylatis, gr. x.

Aquæ, \bar{z} j.

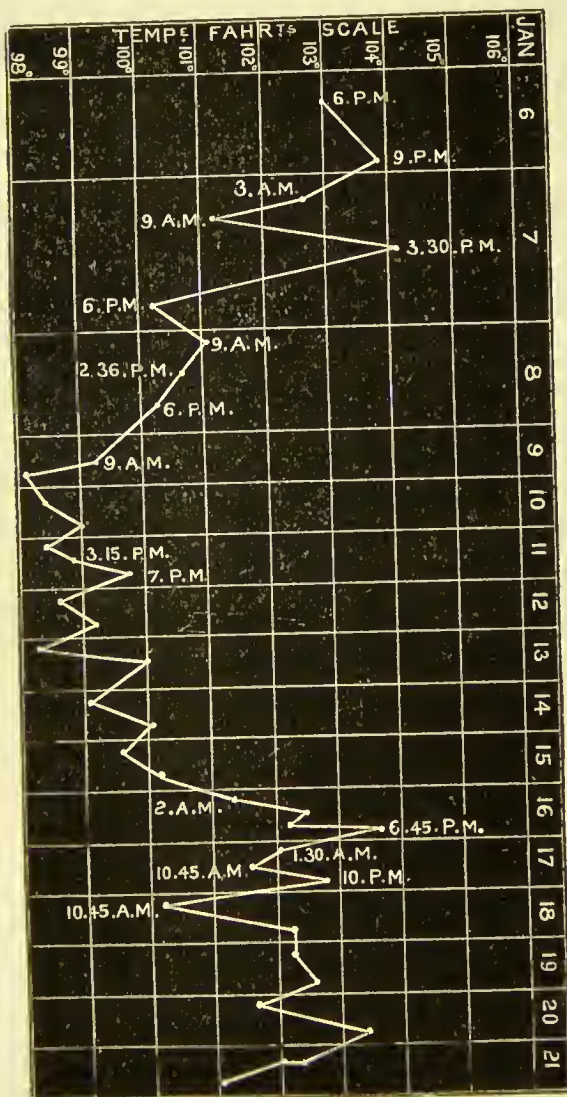
every four hours.

January 21.—The patient died this morning.

Post-mortem examination, eighteen hours after death.

—Rigor mortis persistent. On opening the cranium, there was seen to be an excess of fluid in the cavity of the arachnoid, with hyperæmia of the pia mater. The pericardium contained some dark coloured

serum, and the anterior and most of the posterior surface were adherent to the heart. Both surfaces



were thickly coated with lymph. The interior of

the heart showed well-marked endocarditis about the mitral and aortic valves. There were evidences of recent inflammation in both pleuræ, especially at the lower part, and the lower lobes of both lungs were much congested. The liver, spleen, and kidneys appeared to be quite normal.

Remarks.—This case would appear to show that pericarditis may supervene even when the joint affection has been subdued by the salicylate of soda.

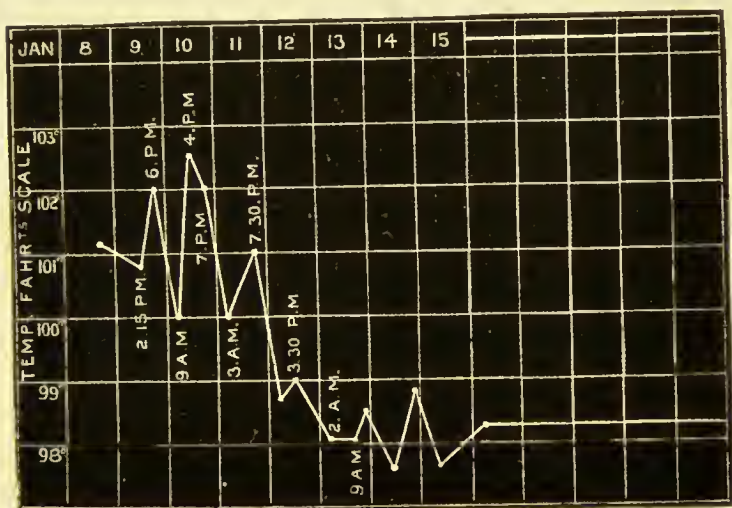
CASE III.

A. F., *æt.* 25, was admitted into Charing Cross Hospital on January 8, 1877, under the care of Dr. Pollock, suffering from acute rheumatism.

History.—The patient is Swiss, and a waiter. He had an attack of rheumatic fever nine years ago, but has never had any other illness. He dates the commencement of his present attack from the 4th inst., when he felt pain in the hip, knee, and ankle joints, but he kept about until the 6th, on the morning of which day he could not get up on account of the severe pain in his joints, which were also swollen. He felt very hot, and perspired a good deal. Felt very thirsty, and had no appetite. The bowels were regular. He had some headache, and the pain in the joints was worse at night, and kept him from sleeping.

During the next two days he got worse, and on the 8th inst. was admitted into the hospital.

Present state: January 9.—The patient is a strong, well-nourished man. He complains of severe pain in both hip, knee, and ankle joints, which is



worse at night. He is perspiring profusely, is very thirsty, and has no appetite. Temperature 101° F. Pulse 120. Bowels rather confined. Urine pale, but loaded with lithates. Tongue covered with a thick creamy fur. No cardiac mischief.

Ordered—*R. Sodæ salicylatis*, gr. xv.

Aquæ, $\frac{3}{4}$ j.

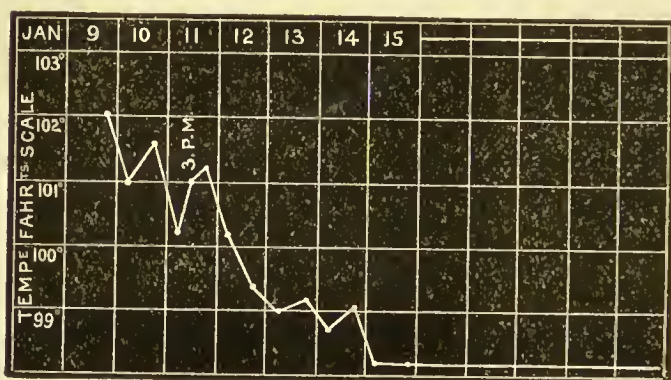
every three hours.

On the 10th his temperature went as high as 102.5°, but from that point fell steadily, until on

the 13th it became normal. He was then practically convalescent, and left the hospital ten days afterwards.

CASE IV.

G. W., *æ*t. 14, was admitted into Charing Cross Hospital on January 9, 1877, under the care of Dr. Pollock, with acute rheumatism.



History.—The patient is a page. He never had rheumatism before, nor any other illness except measles. His illness began on the 3rd inst., when he caught cold, shivered, and had some pain in his left ankle, which was swollen. The next day the right ankle became affected, and subsequently both knees became swollen and painful. He felt very hot, but did not perspire much. The pain in the

joints is worse at night. Bowels regular. No especial thirst.

Present state: January 10.—The patient is pale, rather thin, and looks tired. He complains of pain in both knees, which are swollen, but not red; and since admission the left wrist has become painful and a little swollen. He has no swelling in the feet or ankles. No headache. Does not perspire. Appetite bad. No thirst. The pains in the joints are worse at night. Pulse 90. The middle of the tongue is covered with a white fur. Bowels regular. Urine pale, acid. Lungs, heart, etc., perfectly normal. Temperature on admission 102° F.

Ordered—R. Sodæ salicylatis, gr. x.

Aquæ camphoræ, $\frac{3}{4}$ j.—t. d. s.

Joints wrapped in cotton wool and bandaged.

January 23.—The temperature fell pretty rapidly, and on the 14th inst. was normal, and the patient convalescent. He left the hospital to-day.

CASE V.

A. M., æt. 19, was admitted into Charing Cross Hospital on January 17, 1877, under the

care of Dr. Pollock, with acute rheumatism and mitral regurgitation.

History.—The patient is a barmaid. She had rheumatic fever six years ago, and again in 1875. She ascribes her present illness to overwork. She has been unwell for some time, but became actually ill about a week ago. The attack came on rather suddenly in the night with pain in the joints and a rigor. She has been more or less delirious since her admission, and her manner is excited and odd.

Present state : January 19.—On the evening of her admission the temperature was 101° F. The next morning it was 102·6°; from which time there has been a rapid fall to normal. The patient lies with the head low, breathing calmly. She is very pale and looks exhausted. She seems rather dull this morning, but understands and answers questions. She is rather deaf, with ringing in the ears, and has some frontal headache. (She is taking salicylate of soda.) There is no pain now in any of the joints. The skin is moist and perspiring. Patient is fairly well nourished, but very anæmic. Position of heart is normal, but there is a soft blowing systolic murmur at the apex. Pulse 104, regular. No lung symptoms. The tongue is moist, and covered with scattered patches of thick white fur. Bowels open. Urine pale, acid. Feels sick after taking her medicine, which has been since admission fifteen

grains of salicylate of soda in water every three hours. Is on No. 1 diet.

January 23.—At the visit on the 19th Dr. Pollock ordered the salicylate to be discontinued. The cerebral symptoms abated, but the temperature rose a little. On the 21st she was ordered *mistura ferri perchlor.*, $\bar{3}$ ss., t. d. s. The same evening the temperature was 99.8° F. Yesterday morning pain returned in the right knee, and she was put on salicylate of soda, gr. v., in camphor water, three times a day. The pain spread to the other leg in the evening, and the temperature rose to 100.6° F. The patient passed a very bad night, being kept awake by the pain. She is quite calm, but very pale. This morning the knees and ankles of both legs are involved.

January 26.—Since the last note the evening temperature has averaged 102° F., the morning temperature being about 99.8° F. Salicylate of soda has been increased to gr. x.

January 29.—Temperature yesterday evening, 102.6° F. This morning it was 99.8° F. Salicylate increased to gr. xx.

January 30.—Temperature last night was 102° F. This morning it was 100.2° F. Patient was delirious last night, and her manner is excited to-day. She complains of partial deafness with ringing noises in the ears. The joints are better. She perspires a good deal at night.

January 31.—Temperature, a.m. 99° F., p.m. 98° F. Salicylate of soda reduced to gr. v., t. d. s.

February 5.—On the 2nd inst. she was ordered mist. quiniæ c ferro, $\bar{3}$ j., t. d. s. She still looks very pale and anæmic. The cerebral symptoms have disappeared, but the pain has returned in both legs, shoulders, and wrists. Temperature continued normal until last night, when it was 99·8° F. This morning it is 99° F.

Ordered—R. Sodæ salicylatis, gr. x.

Ammon. carb., gr. iv.

Decoct. cinchonæ, $\bar{3}$ j.—t. d. s.

February 7.—Patient is in great pain. Temperature last night 101·6° F., but it is scarcely above normal this morning. She is now taking fifteen grains of the salicylate in water, t. d. s.

February 12.—Is much better. The pyrexia and articular pain have disappeared. Is now taking mistura ferri et ammon. citratis.

February 21.—Ordered to-day—

R. Pot. iodidi, gr. v.

Tinct. guaiaci ammon., $\bar{3}$ ss.

Mist. ferri et ammon. citrat.

Mist. rhei c potass., āā· $\bar{3}$ ss.—t. d. s.

February 23.—Patient is free from any symptoms of rheumatism, but is pale and anæmic. To take mistura quiniæ c ferro, $\bar{3}$ j., t. d. s.

February 26.—Since last note there has been a recurrence of the rheumatic symptoms, but they

have now disappeared under the use of fifteen grain doses of salicylate of soda every three hours.

March 6.—Patient left the hospital to-day, quite convalescent.

Remarks.—This case illustrates how the rheumatism may return again and again in some persons when the salicylate of soda is discontinued. It also shows the peculiar cerebral symptoms that sometimes arise during the use of the drug. The length of the illness was probably due to a great extent to the patient being much out of health when the acute rheumatism came on. The temperature chart is not appended on account of its great length, but the variations in temperature are accurately recorded in the notes.

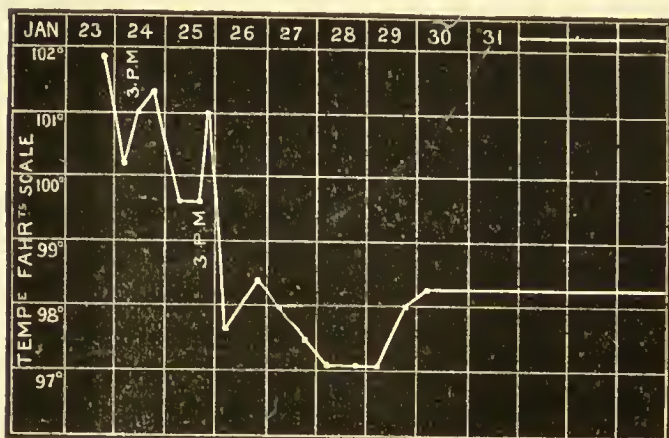
CASE VI.

W. B., *æt.* 23, was admitted into Charing Cross Hospital on January 23, 1877, under the care of Dr. Pollock, with acute rheumatism.

History.—The patient is a groom. Does not inherit any liability to rheumatism or gout, but has had rheumatic fever twice before. He is much exposed to wet and cold, and ascribes his present illness to that cause. It commenced on the 16th inst. with a rigor, and pain in the chest and back, followed by pain in the joints of the legs.

Present state: January 25.—The temperature

on admission was 101.8° F., and it is now 99.6° F. The skin is moist and perspiring. Patient complains of pain in his knees and ankles, which is aggravated by movement. Tongue is dry, and covered with a yellowish white fur. There is some thirst, but no appetite. Bowels regular. No deafness nor ringing in the ears. Is taking sodæ salicylatis, gr. xv., t. d. s.



January 27.—No cerebral symptoms from the salicylate. Temperature rose to 101° F. on the evening of the 25th, but fell to normal yesterday morning, and has remained so. Patient is quite free from pain, but looks pale, and complains of weakness. Tongue still coated. Yesterday the medicine was changed to—

R. Sodæ salicylatis, gr. v.

Mist. rhei c potass., \bar{z} j.—t. d. s.

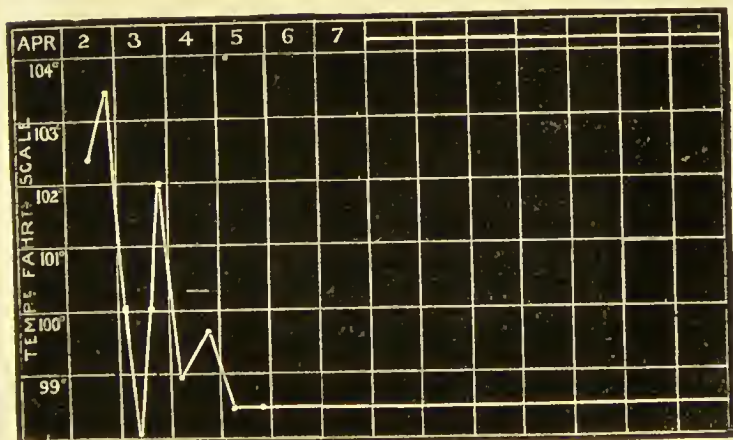
January 30.—Patient is less pale, and ex-

presses himself as feeling much better. Temperature has been normal, and he has been quite free from pain since last note. There have been no cerebral symptoms throughout. To take quinine and iron.

February 9.—Patient left the hospital to-day quite well.

CASE VII.

E. B., *æt.* 20, was admitted into Charing Cross Hospital on April 2, 1877, under the care of Dr. Pollock, suffering from acute rheumatism.



History.—Patient is a domestic servant. Her father, mother, and brother have suffered from chronic rheumatism. She has not had scarlet fever,

nor rheumatic fever, and has always enjoyed good health. She ascribes her present illness to catching cold a month ago. A fortnight before admission she began to have pain and swelling of the joints, which was increased by movement. There were no rigors, but she was very feverish, and perspired a good deal.

Present state.—The patient is pale and anæmic. There are no symptoms referable to either heart or lungs. The chest is well formed. Tongue rather furred. Bowels regular. Patient is on No. 2 diet and fish.

Ordered—R. Sodæ salicylatis, gr. xv.

Aquæ, $\bar{3}$ j.

every three hours.

April 4.—The temperature, which was 103.4° F. on admission, is now normal. The patient is tolerably free from pain, except at night, when she has a little rheumatism in the back, shoulders, and arms. Appetite returning. Tongue still rather coated.

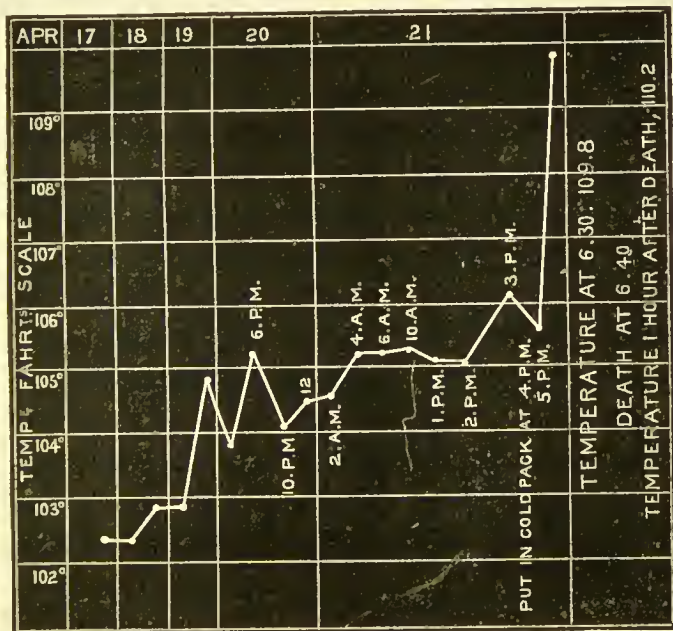
Ordered—R. Sodæ salicylatis, gr. xv.

Mist. rhei \bar{c} potass., $\bar{3}$ j.—t. d. s.

From this time the patient had no return of the rheumatism, and left the hospital well on April 24.

CASE VIII.

E. P., *æt.* 52, was admitted into Charing Cross Hospital, under the care of Dr. Pollock, on April 17, 1877, with acute rheumatism.



This patient was admitted with the ordinary signs of acute rheumatism, the temperature at the time being 102.4° F. He was ordered—

R. Sodæ salicylatis, gr. xv.

Aquæ, \bar{z} j.

every three hours. The temperature gradually rose, and on the evening of the 20th inst., stood at 105.2° F.

On the afternoon of the 21st, when seen by Dr. Pollock, the temperature was $106\cdot2^{\circ}$ F. The skin was hot and pungent, and a copious eruption of sudamina made its appearance over the chest and abdomen. The patient was very delirious. He was put in a wet pack, the salicylate of soda being increased to gr. xxx. every three hours.

The patient gradually became comatose, and died at 6.40, with a temperature of $109\cdot8^{\circ}$ F.

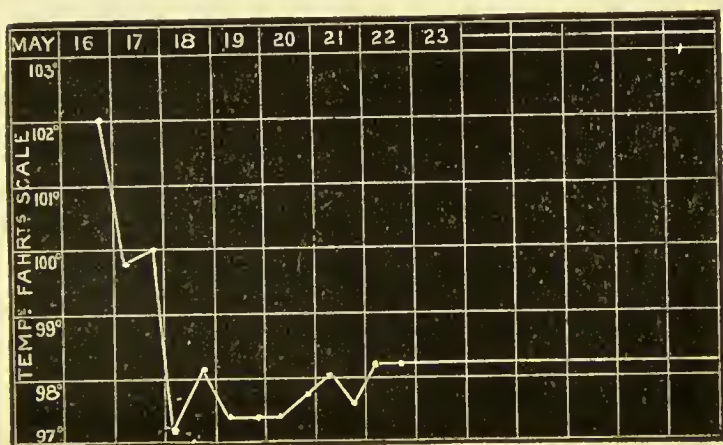
Post-mortem examination twenty hours after death.
—The heart was universally adherent to the pericardium, but the adhesions were old. There were no signs of endocardial inflammation, old or recent. The lungs were much congested. The liver and spleen were much congested, of a dark colour, and very friable. The kidneys also were congested. The colour of the muscles of a peculiarly bright red, and there was an offensive smell about the body quite different from that of ordinary putrefaction. The temperature rose after death to $110\cdot2^{\circ}$ F.

CASE IX.

A. G., *æt.* 14, was admitted into Charing Cross Hospital on May 16, 1877, under the care of Dr. Pollock, with acute rheumatism.

History.—The patient is a baker, and has no

family history of rheumatism. He had rheumatic fever three years ago. He ascribes his present illness to catching cold on going out of the hot bakehouse. It commenced rather suddenly on the 13th inst. with a rigor, followed by swelling in the knees and feet. The pain was aggravated by movement. He has perspired very much.



Present state: May 19.—The temperature on the evening of admission was 102° F., but throughout the 17th it gradually fell, and reached normal on the 18th, and has remained so ever since. There is some pain, increased by movement, in the left knee, which is also swollen. No pain in the chest, and no symptoms of cardiac mischief. The lungs are quite natural. Patient is pale and anæmic. Pulse fairly strong and regular 76. Skin moist and perspiring. Tongue fairly clean. His appetite

is returning, but he is very thirsty. He was ordered from the first—

R. Sodæ salicylatis, gr. x.

Aquæ, \bar{z} j.

every three hours.

The patient rapidly became convalescent, and left the hospital on June 5.

CASE X.

J. G., *æt.* 18, a porter, was admitted into Charing Cross Hospital under the care of Dr. Pollock, on July 17, 1877, with acute rheumatism.

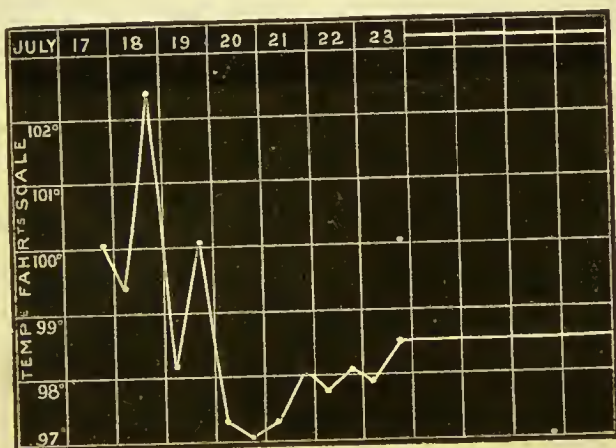
History.—There is no family tendency to rheumatism or gout. He has never had rheumatic nor scarlet fever. He thinks his present illness is due to catching cold in a draughty shop. It commenced with pain in the joints of the feet on the 13th inst. He was very feverish and sweated profusely. The knees have also been painful.

July 23.—The temperature on the evening of admission was 100° F. The next evening it was up to 102·4° F., falling the next morning to normal. In the evening the temperature again rose, and reached 100° F., but since then it has fallen to normal, and remained so. There is no pain nor swelling about the joints now. Skin is

moist. Heart and lungs healthy. Appetite returning.

Patient is on No. 2 diet, with fish, and has been taking since his admission fifteen grains of salicylate of soda in $\frac{3}{4}$ j. of water every four hours.

To-day the medicine was changed to an ounce of the alkaline gentian mixture three times a day.



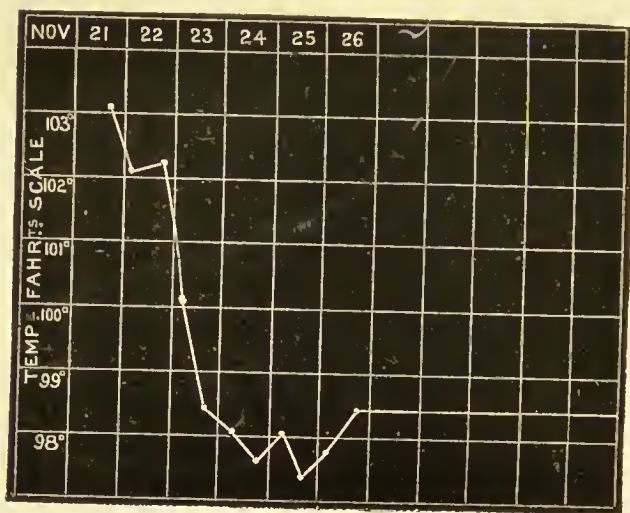
July 27.—The patient left the hospital to-day, convalescent.

Remarks.—By referring to the chart, it will be seen that this patient's temperature went a good deal below normal under the influence of the salicylate of soda. This not unfrequently happens, but I have never known it to be followed by any injurious effect.

CASE XI.

T. McN., *æt.* 28, was admitted into Charing Cross Hospital on November 21, 1877, under the care of Dr. Pollock, with acute rheumatism.

History.—Patient is a porter. His father and mother died of “asthma.” There is no family history of rheumatism or gout. He had an attack of acute rheumatism when twenty years of age, and



was treated in this hospital. He has suffered from dyspnœa on exertion ever since. Has had no other severe illness. His occupation (in Covent Garden Market) entails exposure to the weather, and he has occasionally suffered from colds and rheumatic pains. He ascribes his present illness to catching cold by getting wet through. It began on the night of the 17th inst. with pain in the hips,

accompanied by a rigor, and followed by great heat and perspiration. Since then nearly all the joints, except the ankles, have been involved.

November 27.—The temperature on the evening of admission was 103° F. On the following morning it was 102° F., rising to 102·3° F. the same evening. During the 23rd there was a rapid fall of temperature to normal, at which it has remained ever since. There have been no cerebral symptoms from the salicylate, but the patient was a little deaf on the third evening after admission. He is now quite free from pain, and has had none since the evening of the 24th. The skin is moist. Patient is rather anæmic, is short of breath on exertion, and liable to attacks of palpitation. There is no pain about the heart. The pulse is small and regular—72. There is a soft systolic murmur at apex of heart. Tongue rather coated. Bowels regular. Appetite returning. Patient is on No. 2 diet and fish, and has been taking since admission—

R. Ammon. carb., gr. iij.

Sodæ salicylatis, gr. x.

Aquæ camphoræ, ʒ j.

every four hours, which was reduced to half doses on the 26th.

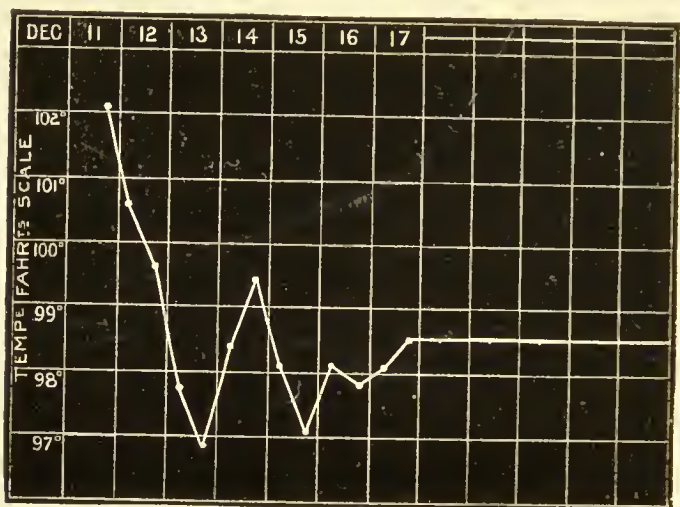
December 3.—Patient is now convalescent, but is rather weak. Has been taking iodide of potassium, steel, and rhubarb, and subsequently quinine and iron.

December 10.—Went out to-day convalescent.

CASE XII.

R. H., *æt.* 39, was admitted into Charing Cross Hospital on December 11, 1877, under the care of Dr. Pollock, with sub-acute rheumatism.

History.—The patient is a commercial traveller, and his father suffered much from gout. A sister suffers from rheumatism. He had an attack of acute rheumatism four years ago.



He attributes his present illness to catching cold. It began about ten days before admission with pains in the joints of the legs, and subsequently involving most of the joints of the body.

December 14.—The temperature on the evening of admission was 102° F. During the 12th and 13th it fell continuously to below normal. He is quite free from pain. Pulse fairly strong

and regular. No cardiac murmur. No lung symptoms. Bowels rather confined. Appetite small. Patient is on No. 1 diet, and has been taking since admission—

R. Ammon. carb., gr. iij.
Sodæ salicylatis, gr. xv.
Spirit. chloroformi, ℥x.
Aquæ, ʒj.

every four hours.

December 15.—The temperature last night was 99·4° F. This morning it is normal. The patient is better. He is a little deaf, and there is some singing in the ears. Medicine to be taken t. d. s.

December 17.—Temperature has been normal since last note. He is now quite free from pain, and the tongue is cleaner.

December 20.—Patient is improving. Half doses of medicine, t. d. s.

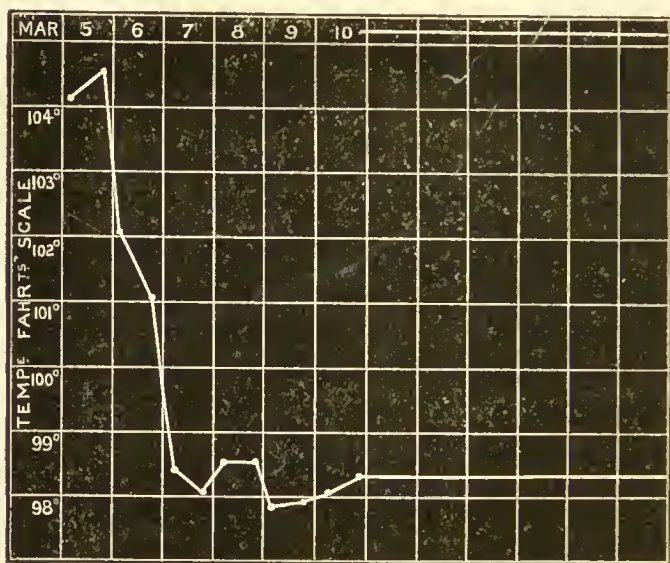
December 29.—On the 22nd a tonic was ordered. The patient continued to improve, and left the hospital to-day, convalescent.

CASE XIII.

E. M., *æt.* 27, was admitted into Charing Cross Hospital on March 5, 1878, under the care of Dr. Silver, suffering from acute rheumatism.

History.—There is no family tendency to rheu-

matism, but she has had two previous attacks of the disease, one in 1870, when she was ill for nine months, and her heart was affected, and another about four years ago, when she was laid up for thirteen weeks. She has had other attacks of rheumatism, but not severe enough to lay her up completely. Up to 1870 she enjoyed good health.



Her present illness commenced two months ago, without any apparent cause. It came on at night, the joints of the upper extremities having been affected first. She was feverish, and perspired a good deal. During the two months she has been confined to the house, but not always to her bed. She was sometimes better, sometimes worse, but just before her admission she became very ill,

almost all the larger joints being in great pain. There has also been considerable uneasiness in the cardiac region.

March 9. — On admission she complained of great pain in all the large joints, especially the knees and ankles. The temperature was 104° F., going up to 104.5° F. in the evening. Since then it has fallen almost perpendicularly, and on the 7th inst. it was normal, and has remained so since. She is now pretty free from pain in the joints, but complains of a feeling of stiffness on moving them. There is pain in the cardiac region, not felt constantly, but brought on by the least motion, and a deep inspiration or coughing will produce it. It is a dull heavy pain, accompanied by some palpitation of the heart. The tongue is coated with a white fur, the appetite is bad, and she feels very weak. The bowels were moved last evening. There is not much sweating now. A bruit can be heard with first sound of heart, loudest at the base, which may be traced down and across the sternum to the apex. The lungs are normal, but there is some bronchitis. The urine was very high coloured, but is natural now.

The patient is on No. 2 diet, and was ordered on March 5—

R. Ammon. carb., gr. iij.

Sodæ salicylatis, gr. xv.

Tinct. camph. co., ℥xx.

Aquæ, $\bar{3}$ j.

every four hours, with linseed poultices to front and back of chest alternately.

On March 8 she was ordered—

R. Mist. quiniæ. alk., \bar{z} j.—t. d. s.
in place of the former mixture.

March 14.—Patient had half an ounce of castor oil yesterday.

R. Ferri et ammon. citrat., gr. xx.

Spirit. chloroformi, \mathfrak{m} xv.

Infusi calumbæ, \bar{z} j.—t. d. s.

March 17.—Patient has continued to improve very much, and went out to-day, quite convalescent.

CASE XIV.

F. B., *æt.* 26, a waiter, was admitted into Charing Cross Hospital on March 18, 1878, under the care of Dr. Pollock, with acute rheumatism.

History.—There is no family history of rheumatism, and up to May last the patient enjoyed good health. He then had an attack of rheumatic fever, which lasted about six weeks. Since then he has had occasional rheumatic pains in his joints, but nothing serious until his present illness, which began four days before admission with pain in the right hip joint, then in the knees and ankles, and lastly in his arms. He was confined to his bed

for two days before he came into hospital, and perspired greatly, the sweat smelling very sour.

On admission the patient's temperature was 100.6° F., but fell rapidly, and on the 21st was normal. The pains in the joints also soon subsided, leaving only a little stiffness in the left elbow joint. The heart seems to be normal, there is no bruit, and the lungs are healthy. He has never suffered from cough. The urine was at first high coloured, but is normal now. Tongue rather coated. Appetite improved. He is on No. 2 diet, with fish.

Patient has been taking since his admission—

R. Ammon. carb., gr. iij.

Sodæ salicylatis, gr. xv.

Aquæ camphoræ, \bar{z} j.

every four hours.

This was changed on the 28th to—

R. Mist. quiniæ c ferro, \bar{z} j.—t. d. s.

and on April 6 he went out convalescent.

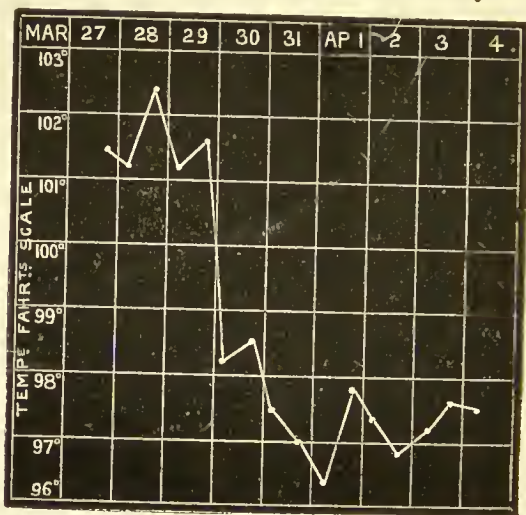
The temperature chart in this case has been mislaid.

CASE XV.

C. B., æt. 24, a sailor, was admitted into Charing Cross Hospital on March 27, 1878, under the care of Dr. Green, with sub-acute rheumatism.

History.—Patient has been a sailor for several

years, and has visited all parts of the world, but does not recollect to have had a day's illness before the present attack. There is no family history of rheumatism. About five days before admission, after five hours sleep, he woke up and found his right knee very stiff and much swollen, so that he was unable to use it. It was much better, however, in the morning, but returned the next night, and he remained in bed the following day without



getting any relief, and he was feverish and felt a dull pain in his joints up to the time of his admission on the 27th. Soon after admission the left knee became swollen and stiff, and subsequently the joints of his left arm were affected. Patient has been accustomed to a warm climate, and ascribes his attack to exposure to cold, rough weather on the English coast.

April 1.—Temperature on March 27 was 101.4° F., and rose on the 28th to 102.5° F. Since that date it has fallen rapidly, and was normal on the 30th. For the first three days there was much perspiration, with the characteristic sour odour. After admission the patient had pain in the wrist, elbow, and shoulder of left arm, and in both knees and ankles, but this soon subsided. Tongue is coated, but moist, and his appetite is improving. He is on No. 2 diet, and has taken since admission—

R. Sodæ salicylatis, gr. xv.

Aquæ, \bar{z} j.

every six hours. On March 31 the medicine was given only t. d. s., and on April 1 was altered to—

R. Mist. quiniæ alkal., \bar{z} j.—t. d. s.

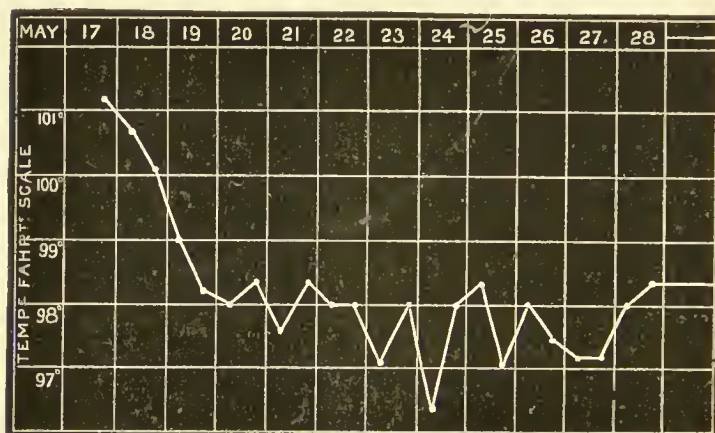
April 4.—The patient has improved rapidly, and left the hospital to-day convalescent.

CASE XVI.

H. H., æt. 20, a draper's assistant, was admitted into Charing Cross Hospital on May 17, 1878, under the care of Dr. Pollock, with acute rheumatism.

History.—His father died of phthisis. His mother is still living. She had rheumatic fever

when a girl, and still suffers from rheumatic pains. A sister died from heart disease, the sequel of acute rheumatism. Patient has been a draper's assistant since he was fourteen years old, and has always had fair health. When he was about twelve years old he burnt his left thigh severely with some fireworks, which laid him up for about twelve months. It did not make him permanently lame, however. About a fortnight before admission he had a slight



cold and sore throat. After a few days he felt very weak, and had to give up work. On the night of the 15th inst. he took a long walk without any overcoat, and felt very shivery. The next day he was unable to get out of bed on account of pain in the knees and ankles. He lost his appetite, and felt very thirsty. He did not perspire much. Next day he was admitted into the hospital.

May 21.—Patient's temperature on admission

was 101.2° F., but it fell rapidly under treatment, reaching 98° F. on the 20th. The pains in the knees and ankles were soon relieved, and he is now much improved. His appetite is improving. Skin is moist and warm. Tongue cleaning. There is nothing wrong with the heart or lungs, but the pulse is rather slow, but quite regular. Urine feebly acid. Is on No. 1 diet, with fish. Ordered on admission—

R. Ammon. carb., gr. iij.

Sodæ salicylatis, gr. xv.

Aquæ camphoræ, $\frac{3}{4}$ j.

every four hours, which on the 21st was reduced to half doses.

May 27.—Since the 21st the temperature has been below the normal, averaging 97.5° F. Ordered to-day—

R. Sodæ salicylatis, gr. viij.

Mist. quiniæ alk., $\frac{3}{4}$ j.—t. d. s.

He subsequently took quinine and iron, and left the hospital convalescent on June 7.

